

REMARKS

The Amendment to the Specification

The specification has been amended to correct a typographical error in the second equation in paragraph [0008]. The correct equation can be derived from the first and third equations in paragraph [0008]. Therefore, no new matter has been added by way of this amendment.

The Pending Claims

Claims 1-21 are pending. Claims 1-17 are directed toward a polishing pad comprising a porous polymeric material, wherein the porous polymeric material has a negative Poisson's ratio. Claims 18-21 are directed toward a method of polishing with the aforementioned polishing pad.

The Amendments to the Claims

Claim 18 has been rewritten as an independent claim. No new matter has been added by way of this claim amendment.

Summary of the Office Action

The Office Action objects to claim 18 under 35 U.S.C. § 112, second paragraph, as being indefinite.

The Office Action rejects claims 1-21 under 35 U.S.C. § 103(a) as allegedly obvious in view of U.S. Patent 6,095,902 (hereinafter "Reinhardt") in combination with the BASF publication "Elastollan – Material Properties" (hereinafter "the BASF publication"), alone or in further combination with U.S. Patent 6,705,934 (hereinafter "Shiro et al."), U.S. Patent 6,126,532 (hereinafter "Servilla et al."), U.S. Patent 6,120,353 (hereinafter "Suzuki et al."), U.S. Patent 6,241,596 (hereinafter "Osterheld et al."), and U.S. Patent 5,949,927 (hereinafter "Tang").

Response to the Indefiniteness Objection

Claim 18 has been rewritten as an independent claim without changing the scope of the claim. Applicants respectfully request withdrawal of the indefiniteness objection.

Response to the Obviousness Rejections

Applicants respectfully traverse the obviousness rejections of claims 1-21.

As is well-settled, in order to establish a *prima facie* case of obviousness with respect to a claim, at least two criteria must be met: (1) the prior art references must suggest to one of ordinary skill in the art to make the subject matter defined by the claims in issue, and (2) the prior art references must provide one of ordinary skill in the art with a reasonable expectation of success in so making the subject matter defined by the claims in issue. Both the suggestion and the reasonable expectation of success must be found in the prior art references, not in the disclosure of the patent application in issue. See, e.g., *In re Vaeck*, 947 F.2d 488, 493, 20 U.S.P.Q.2d 1438, 1442 (Fed. Cir. 1991). For the reasons delineated below, Applicants submit that there is no suggestion or motivation in any of the references cited in the Office Action to modify the polishing pad disclosed in the Reinhardt patent in the manner necessary to provide the polishing pad defined by the rejected claims. Therefore, a *prima facie* case of obviousness has not been established.

Rheinhardt is said to disclose a polishing pad made of polyurethanes exhibiting the following properties: density greater than 0.9 g/cm³, tensile modulus between 0.2 and 5 GPa, a hardness between 25 and 80 Shore D, a yield stress between 300 psi and 6000 psi, tensile strength between 500 psi and 15,000 psi, and elongation to break up to 500%. The BASF Elastollan C-64D Polyurethane Elastomer described in the BASF publication is said to exhibit properties that fall within the ranges disclosed by Reinhardt, as well as a shear modulus of 0.25 GPa. Using the shear modulus and tensile modulus values of the Elastollan C-64D, a Poisson's ratio of -0.2 was calculated for the polymer. It is asserted in the Office Action that “[b]ecause the Elastollan C-64D is one of a limited group of materials that exhibits all of the properties disclosed in Reinhardt's polishing pad, it would be obvious to one of ordinary skill in the art at the time the invention was made to use the Elastollan C-64D to produce the polishing pad disclosed by Reinhardt.” See Office Action, p. 3.

The Office Action asserts that knowledge of the commercially available Elastollan C-64D and its physical properties such as shear and elastic modulus, combined with the disclosure of Reinhardt, would provide the suggestion or motivation to make a polishing pad with a porous polymer material having a Poisson's ratio of less than zero. However, “[t]he mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination.” *In re Mills*, 916 F.2d 680, 19 USPQ2d 1430 (Fed. Cir. 1990) (emphasis in the original). As stated in the Office Action, “Reinhardt fails to disclose that the polyurethane to be used shall be a thermoplastic or thermoset polymer with a Poisson's ratio between -0.8 and -0.2.” See Office Action, p. 3. Moreover, the negative Poisson's ratio of the Elastollan C-64D is an inherent property of the polymer, and the BASF publication fails to disclose or teach any behavior of a polymer with a negative Poisson's ratio that would make it a better quality

material for a polishing pad, i.e. superior toughness and tear resistance because of the high extensibility. Finally, Applicants disagree with the conclusion that Elastollan C-64D is “one of a limited group of materials that exhibits all of the properties disclosed in Reinhardt’s polishing pad.” There are hundreds of commercially available polyurethane polymers, and the ranges of physical properties disclosed in Reinhardt are so broad as to encompass many different polymers. See, e.g. <http://www.matweb.com>. Applicants submit that the Office Action fails to establish that Elastollan C-64D “is one of a limited group of materials” to be selected for the invention disclosed in Reinhardt. Thus, Reinhardt and the BASF publication provide no motivation to one of ordinary skill the art to produce a polishing pad of the present invention as defined by the pending claims, and a *prima facie* case of obviousness has not been established based on the combination of Reinhardt and the BASF publication.

Neither Shiro et al., Servilla et al., Suzuki et al., Osterheld et al., nor Tang teaches or discloses a polishing pad comprising a porous polymeric material with a negative Poisson’s ratio. Therefore, these additional references do not cure the lack of a *prima facie* case of obviousness against the pending claims.

In view of the foregoing, the subject matter of claims 1-21 cannot properly be considered obvious in view of the cited references. Accordingly, Applicants respectfully request that the obviousness rejections be withdrawn.

Conclusion

The application is considered in good and proper form for allowance, and the Examiner is respectfully requested to pass this application to issue. If, in the opinion of the Examiner, a telephone conference would expedite the prosecution of the subject application, the Examiner is invited to call the undersigned attorney.

Respectfully submitted,


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